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### Links between social information processing in middle childhood and involvement in bullying. [IF 0.95]

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The aim of this study was to investigate the way in which bullies, victims, bully/victims, and those not involved process social information. A peer nomination measure of bullying and victimization was administered twice over an interval of one year. The sample consisted of 236 (126 girls and 110 boys) children at the beginning of the study (T1) and 242 children one year later (T2) (mean age: 8 years). To test how children responded when provoked, both spontaneously and after prompting, we used provocation scenarios, and to test their attributional interpretations we used ambiguous scenarios. The results showed that children not involved in bullying responded in an assertive way to provocation more often than bullies and victims, but not more than bully/victims. In general, aggressive answers diminished after prompting and irrelevant answers increased. Appealing for the help of an adult or a peer was the strategy most often chosen. When the intent of the perpetrator was ambiguous, bully/victims attributed more blame, were angrier, and would retaliate more than those not involved. Partly similar results were obtained when stably involved children were compared with those unstably involved. Suggestions for intervention are presented. *Aggr. Behav.* 29:116–127, 2003. © 2003 Wiley-Liss, Inc.

**Key words:** bully; victim; bully/victim; social information processing; response decision; attribution

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self-reporting for assessing bullying and victimization have been devised and studied [Pellegrini, 2001; Perry et al., 1988; Salmivalli et al., 1996]. Studies have been carried out into the backgrounds and characteristics of children involved in bullying [Boulton and Smith, 1994; Hawker and Boulton, 2000; Pellegrini et al., 1999] and a fair amount of work has been done on ways of developing intervention programs in order to stop this behavior [Olweus, 1993; Salmivalli, 1999; Smith et al., 2001]. More recently, investigators have begun to focus on social knowledge and social cognitions of children involved in bullying. These studies are based on one of the two important theories on the topic: theory of mind [Sutton et al., 1999, 2001] and social information processing [Crick and Dodge, 1994; Dodge, 1986].

In the present study the issue of bullying was investigated from the perspective of social information processing. There is still a dearth of studies that approach the topic from this point of view [Almeida et al., 2001; Lo Feudo et al., 2001], even though this approach is considered to be among the most important heuristic perspectives on aggression [Pettit et al., 2001]. It was originally developed by Dodge [1986] and reformulated by Crick and Dodge [1994]. Their new model consists of six stages, depicting a sequential series of steps in a circular formula, from the encoding of cues to behavioral enactment. At step 1 the child encodes sensory input in a given social situation into information bits. These need to be interpreted (step 2). The child needs to clarify and select his goals (step 3). At this point, the child has to look for a response or construct one, on the basis of its presumed efficacy and evaluation of the available means (step 4). Then the child can decide which response is best (step 5). Finally, at step 6, he enacts the behavioral response.

Other explanatory models, like Salmivalli's systematic description of different social roles and their interactive characteristics [Salmivalli et al., 1996] or Sutton's focus on the Theory of Mind as a prerequisite of social competence [Sutton et al., 1999, 2001], might in some ways complement the systemic social information processing approach. However, we opted for the social information processing framework since it offers a heuristic approach to decomposing complex processes in specific classes of cognitions which may be relatively easy to assess. Moreover, the success of the framework has amply been demonstrated with aggressive children. Theory, and the authors themselves, suggested it as a useful tool for research on bullying.

The general ideas behind this approach are that children (and people in general) differ in the extent to which they understand and interpret social situations, and that—together with past experiences and biological capabilities—these differences influence their behaviors [Lemerise and Arsenio, 2000]. In fact, past experiences and biological capabilities may be reflected in latent cognitive structures which are thought to affect processing of social information. Relationships with parents and peers, attachment working models, education, temperament, and social learning are all examples of what may be stored in a database constituting one's social knowledge and providing interpretative information about the outside world and ways to respond to this world [Crick and Dodge, 1994; Pakaslahti, 2000; Pettit et al., 2001].

Many studies have focused on the social skills of aggressive children and the reasons why they respond aggressively [Cairns and Cairns, 1991; Dodge and Crick, 1990; Pakaslahti, 2000; Sutton et al., 1999]. Aggressive children generate only few alternative solutions when facing a social problem [Guerra and Slaby, 1989] and tend not to have nonaggressive solutions in their repertoire [Crick and Dodge, 1994]. Rudolph and Heller [1997] have suggested that these children respond aggressively because they either do not know any prosocial responses or because their response is more emotionally tinged and less deliberate.

These authors demonstrated that the number of socially competent responses increased after reflection, suggesting that aggressive children might have social knowledge, but have difficulty in using that knowledge spontaneously.

Dodge [1991] and Dodge and Coie [1987] hypothesized that there were two different types of aggression, namely reactive and proactive aggression. Reactive aggression is characterized by an angry and defensive reaction to frustration, while proactive aggression is goal-directed, cold-blooded, dominant and coercive. Some authors [Crick and Dodge, 1996; Dodge and Coie, 1987; Loeber and Coie, 2001; Pettit et al., 2001] have claimed that the two types of aggression are characterized by different mistakes (or deficits) in the processing of social information. In fact, they based their claim on the finding that reactively aggressive children attributed hostile intentions to their peers and responded in an aggressive way, thus showing deficits in interpreting social cues (step 2 of the SIP model). Reactively aggressive children did not show aggression in response to consequences of an act, but to their perception of the intentions of the target [Arsenio and Lemerise, 2001]. Proactively aggressive children, on the other hand, evaluated aggression in a more positive way and as a valid means to reach goals. This points to different cognitive patterns in goal selection, response construction and behavioral decision (steps 3, 4, and 5 of the SIP model). These proactively aggressive children acted aggressively only in order to attain their goals at the expense of others [Arsenio and Lemerise, 2001].

Applying the reactive and proactive aggression distinction to the domain of bullying, some researchers [Crick and Dodge, 1999; Kochenderfer and Ladd, 1997; Price and Dodge, 1989] suggested that bullies are characterized by proactive aggression and victims by reactive aggression. Recent studies [Camodeca et al., 2002; Pulkkinen, 1996; Salmivalli and Nieminen, 2002] partly supported this view, showing that victims were indeed reactively aggressive, while bullies and bully/victims displayed both types of aggression.

In this study two types of hypothetical scenarios were used to investigate social information processing: provocation scenarios (in which the children were the victim of an act that was deliberately directed against them) and ambiguous scenarios (in which the intention of the child responsible for the negative action was not clear). When the provocation situations were used, the children were asked not only how they would respond, but also what else they could do and what would be the best thing to do. Thus, it was possible to test their social knowledge in both a spontaneous response and after prompting. The procedure was derived from Rudolph and Heller [1997]. Since the situations were provocations, and the children were asked to choose a strategy spontaneously, no differences were expected in terms of aggression between bullies, victims, and bully/victims, as all of them were supposed to respond with reactive aggression to provocation. But children not involved in bullying were expected to show more social competence in the face of provocation, by being less aggressive and more assertive than those who were involved.

We expected that after prompting, the number of aggressive responses would diminish [as was also found by Rudolph and Heller, 1997]. Moreover, in line with Pakaslahti [2000], we expected that those not involved would give more alternative problem-solving solutions, while children involved in bullying would generate fewer solutions.

In order to test whether bullies, victims, bully/victims and those not involved also differed from each other in the domain of interpretation, ambiguous scenarios were used. When the intent of the others is ambiguous, reactively aggressive children in particular attribute hostile intents to their peers more than nonaggressive or proactively aggressive children do [Crick

and Dodge, 1996; Dodge, 1991; Dodge and Coie, 1987]. Victims and bully/victims were expected to be like reactively aggressive children and to have deficits in making attributions of intent more often than bullies and those not involved, and, consequently, to favor a retaliatory response, namely aggression. We also expected victims and bully/victims to express more anger, which is usually linked to attributions of hostile intent to others [Graham et al., 1992].

The design of this study is longitudinal with assessments at two points in time, with a year between the first and the second measurement. This longitudinal design enabled us to distinguish between those children stably involved in bullying (either as bullies, victims, or bully/victims) and those children who were only involved in one year and not in the other year. Incidental involvement in bullying may have other correlates than stable involvement. For example, incidental involvement may be associated more strongly with group processes (which may have indirect links to social information processing, but which may also be determined by random factors such as composition of the group), while stable involvement may be associated more strongly with social information processing.

In sum, this study investigated: 1) whether bullies, victims, bully/victims, and children not involved in bullying differed in the way they responded to provocation; 2) whether they provided different responses in the spontaneous and the prompting situations; 3) whether bully/victims and victims were more prone to interpret ambiguous situations as hostile and to favor retaliatory response; 4) whether children stably involved in bullying showed these differences more than those unstably involved.

## **METHOD**

### **Procedure**

Data were collected in the spring of 1998 (T1) and 1999 (T2). Bullying and victimization were assessed at both points of time by means of the Aggression and Victimization Scale. Social information processing was also investigated twice, by means of provocation scenarios, at T1, and ambiguous scenarios, at T2. Children were taken into a quiet room and were tested in private. The interviewers asked them not to discuss the questions with their peers and told them that the information supplied would be treated as confidential.

### **Sample**

The sample employed in this study has also been tested at other points in time and using several instruments [Camodeca et al., 2002]. At T1, 236 children (126 girls and 110 boys) took part. They were attending third and fourth grade in four schools in the Netherlands. At T2, 242 children (126 girls and 116 boys) were tested. Their age ranged from 91.4 months at T1 ( $SD=9.1$ ) to 105.1 months at T2 ( $SD=8.4$ ). Some children left the study after T1, while others entered at T2. This was because their families either moved away from or moved to the school's catchment area. In fact, 215 children (91.1%, 47% boys and 53% girls) were in the study at both points in time, but we always made use of all the pupils present at a particular point in time (except for the comparison between stably involved subjects and incidentally involved subjects, for which we employed the 215 participants present on both occasions). The consent of the parents had been obtained by way of a letter describing the purpose of the study, the procedures involved, and the longitudinal nature of the project. Copies of

this letter had been handed out by the teachers to the children. More than 90% of parents consented to their children's participation in the study. In those cases where the parents did not agree, we asked for permission to use their child as an informant on the bullying and victimization of other pupils and this was always given. This relatively high rate of consent may have been prompted by the support given by the school principals to the study. In socioeconomic terms, the families were predominantly from middle-class backgrounds.

## Measures

**Bullying and victimization measure.** In order to assess bullying and victimization at T1 and T2, we used the Aggression and Victimization Scale [Camodeca et al., 2002; Perry et al., 1988], translated into Dutch. The original version consists of 7 aggression items, 7 victimization items and 12 filler items. Pupils were requested to nominate same-sex peers who fitted the behavior described in each item, excluding themselves from the list.

We shortened the questionnaire by removing 6 of the 12 filler items and two aggression items which pointed more to aggression in general rather than to bullying or harassing others [for examples and psychometric properties, cf. Camodeca et al., 2002]. The reliabilities (Cronbach's alphas) were high at both points in time: at T1  $\alpha = .90$  for bullying and  $\alpha = .89$  for victimization, and at T2  $\alpha = .93$  and  $\alpha = .92$  for the two scales respectively. We divided the scale by  $n-1$ , where  $n$  is the number of same sex peers.

Besides the continuous scales for bullying and victimization, we also computed nominal scores. The T1 85th percentile of the two scales (.93 and 1.27, respectively) was chosen as a cutoff point for both points in time in order to avoid biases due to different distributions. In this way we obtained, for T1 and T2, the following categories: *bully* (scoring above .93 on the bullying scale and below 1.27 on the victimization scale;  $n = 23$  at T1 and  $n = 18$  at T2), *victim* (scoring above 1.27 on the victimization scale and below .93 on the bullying scale;  $n = 20$  at T1 and  $n = 13$  at T2), *bully/victim* (scoring above the cutoff points on both scales;  $n = 18$  at T1 and  $n = 7$  at T2) and *not involved* (all the rest;  $n = 175$  at T1 and  $n = 204$  at T2).

We also found prevalence figures for the 70th, 75th, and 80th percentile for assigning the subjects to the categories. The results were comparable, except for the fact that the number of bully/victims increased considerably with the reduction in the cutoff score, while the number of bullies and victims remained similar. Thus, we preferred to select bullies and victims who conformed to a stricter criterion and who were better differentiated from the bully/victims. Moreover, the 85th percentile score is in line with the cutoff score used by Perry et al. [1988] when they linked aggression and victimization (at the nominal level) to peer rejection.

**Social information processing measures.** Different instruments for assessing social skills at T1 and T2 were employed. At T1, we used six provocation scenarios in which children had to provide solutions to various bullying situations. At T2, we used a set of four ambiguous scenarios for the attributions of intentions and emotions. In both cases, the stories were told in such a way that the subjects imagined themselves being the victim of some mishap. One example of a provocation scenario used at T1 is: "You are talking with a friend when another classmate walks past and starts calling you names. He/she has recently started doing this." We asked three questions for each scenario: "Suppose this happens to you: a) What would you do? b) What else could you do? c) What do you think is the best thing to



do?”. Each question was asked after children had answered the previous one. The answers were written down verbatim by the interviewer and then coded into one of the following five categories: 1) *aggression*, which included both physical aggression and verbal aggression; 2) *assertiveness* (e.g. “I’d ask for an explanation”); 3) *asking for help* both from an adult and a peer; 4) *avoidance* (e.g. “I’d do something else”); 5) *irrelevance* (the answer did not fit the question, or the child did not answer at all). The categories were totaled for each of the questions (a, b and c) separately over all scenarios. Thus, subjects could get a maximum of 6 and a minimum of 0 for each category and for each type of question. A 6 would indicate that they had given that type of answer six times, one for each provocation situation. To establish the agreement between raters, 40 (16.5%) random cases were coded by two different experimenters independently. The mean intercoder percentage of agreement was 85.6%, with a range of 75%–95%.

At T2, four brief stories were employed, in two versions, one for boys and one for girls. Each of them described a situation in which the intent of the perpetrator was ambiguous. An example is: “You are on your way to school when you see that your shoe laces are untied. You leave your bag on the ground while you tie them. Your favorite book falls out of the bag. At that moment another child passes by and steps on your book. Now there are footmarks on it. You look up and see this child looking at your book and then at you.” For each story children answered six questions: 1) whether they considered the perpetrator as mean, 2) whether they thought that he/she had done it on purpose, 3) whether they thought that he/she was happy with the outcome, 4) how much they thought him/her guilty, 5) how angry they were with him/her, 6) how much they felt like doing something back. For the first three questions, subjects had to choose on a 3-point scale: *No* (0), *I don’t know* (1), *Yes* (2), while for the other three questions the answer modality was on a 5-point scale (*not at all* (1) to *very much* (5)). Six factor analyses (PCA) were run with each question per four scenarios to see whether scales could be formed on the basis of the same type of answer. Two questions ((2) on purpose and (3) happy) were deleted because of loadings lower than the other scales (which ranged from .62 to .84) and because of low reliabilities and item-total correlations. Alpha coefficients for the four other scales were as follows: *meanness* ( $\alpha = .60$ ), *blame* ( $\alpha = .74$ ), *anger* ( $\alpha = .81$ ), and *retaliation* ( $\alpha = .79$ ). We totaled the scores for each question separately, across the four scenarios. Totaled scores ranged from 0 to 8 for question (1) (meanness) and from 4 to 20 for the other three.

## RESULTS

**Provocation situations and involvement in bullying.** On data collected at T1 we ran a 4 (role in the bullying situation) by 2 (sex) mixed-model MANOVA, testing for both between- and within-effects. As sex did not appear to have any effect at all, the analysis was rerun without this variable. Dependent variables were the five types of answers totaled through the three situations.

A significant between-subjects effect was found (Pillai’s Trace = .10;  $F(12, 693) = 1.94$ ;  $p < .05$ ). The univariate test between subjects showed a significant result only for assertiveness ( $F(3) = 5.91$ ;  $p < .01$ ). Post hoc test (Bonferroni) showed that children not involved in bullying reported more assertive responses than bullies and victims, but not more than bully/victims. Means and standard deviations (in parentheses) were as follows: bully: 1.43 (1.34); victim: 1.85 (1.79); bully/victim: 3.06 (2.24); not involved: 3.16 (2.28). The three

situations (spontaneous, first, and second prompt) were also explored separately and again those not involved reported more assertive responses than bullies and victims in the spontaneous situation (Pillai's Trace = .10;  $F(12, 693) = 1.95$ ;  $p < .05$ ; univariate test:  $F(3) = 5.33$ ;  $p < .01$ ). No significant between-subject effects were found in the two prompt situations.

The within-subjects effect was also significant (Pillai's Trace = .46;  $F(8, 225) = 23.52$ ;  $p < .001$ ). Table 1 shows the univariate test (Huynh-Feldt), means, and standard deviations for differences across the three situations.

As expected, the number of aggressive answers diminished from the spontaneous situation to the first prompt and again to the second prompt, when very few aggressive responses were given. With respect to the other types of answers, asking for the help of someone else (teacher, parent, friend) was most frequent in the spontaneous situation and was also produced most often as the best solution to cope with provocation. The number of answers for avoidance was higher after the first than after the second prompt. After the first prompt, irrelevant answers (or no answer at all) were more frequent than the other categories and, although this type of answer diminished somewhat after the second prompt, more irrelevant answers were still given than initially in the spontaneous situation. The number of assertive answers did not change from one situation to the next.

**Ambiguous situations and involvement in bullying.** On T2 data a multivariate analysis of variance with a 4 (role) by 2 (sex) design was run. Gender was again not significant, so we reran the analysis with just the four roles for involvement in bullying as independent factors and the answers to the four questions (meanness, blame, anger and retaliation) as dependent variables. The multivariate test was significant (Pillai's Trace = .11;  $F(12, 660) = 2.03$ ;  $p < .05$ ). The univariate test, means and standard deviations are shown in Table 2. Bully/victims had higher scores than children not involved on blame, anger and retaliation. In the case of blame, bully/victims also scored higher than bullies. Victims followed, although differences were not significant. The groups did not significantly differ in their interpretation of the behavior of the child in the ambiguous situation as mean.

**Table 1. Means, Standard Deviations (in Parentheses) and Test of Group Differences of the Three Different Answers at T1**

	(a)	(b)	(c)	$F(df)$
Aggression	1.07 (1.22) <sup>a†</sup>	.81 (1.03) <sup>b†</sup>	.45 (.78) <sup>c</sup>	19.55 (1.87)***
Assertiveness	1.08 (1.02)	.82 (.96)	.98 (1.04)	.22 (1.82)
Help	2.43 (1.41) <sup>ab</sup>	1.44 (1.18) <sup>c</sup>	2.39 (1.61) <sup>b</sup>	34.01 (1.92)***
Avoidance	1.06 (1.03) <sup>ab</sup>	1.18 (1.11) <sup>a</sup>	.86 (1.04) <sup>b</sup>	7.18 (1.81)**
Irrelevance	.36 (.60) <sup>a</sup>	1.74 (1.49) <sup>b</sup>	1.32 (1.56) <sup>c</sup>	49.39 (1.74)***

(a) = "What would you do?"; (b) = "What else could you do?"; (c) = "What do you think is the best thing to do?" Means in the same row with different superscripts (a-c) differ significantly at  $p < .05$ , two-tailed ( $†p < .10$ ) by the Bonferroni test.

\*\* $p < .01$ .

\*\*\* $p < .001$



**Table II. Means, Standard Deviations (in Parentheses) and Test of Group Differences of the Three Significant Variables at T2 (Blame, Anger and Retaliation)**

	Bully	Victim	Bully/victim	Not involved	<i>F</i> (df)
Blame	10.76 (3.38) <sup>b†</sup>	10.92 (3.82) <sup>ab</sup>	14.83 (5.49) <sup>a†</sup>	9.91 (3.35) <sup>b</sup>	4.41 (3)**
Anger	12.88 (4.34) <sup>ab</sup>	13.42 (3.65) <sup>ab</sup>	16.17 (4.45) <sup>a</sup>	11.64 (3.60) <sup>b</sup>	4.06 (3)**
Retaliation	8.71 (4.52) <sup>ab</sup>	8.75 (5.01) <sup>ab</sup>	11.50 (5.54) <sup>a</sup>	7.08 (3.55) <sup>b</sup>	4.03 (3)**

Means in the same row with different superscripts (a–b) differ significantly at  $p < .05$ , two-tailed ( $^{\dagger}p < .10$ ) by the Bonferroni test.

\*\* $p < .01$ .

**Social information processing and stability of involvement in bullying.** In order to compare those children who were involved in bullying at both times (8 bullies, 3 victims, 6 bully/victims) with those who were involved at one time only (20 bullies, 23 victims, 3 bully/victims), we constructed a variable including all the groups (stable bullies, unstable bullies, stable victims, unstable victims, stable bully/victims, unstable bully/victims and not involved), which served as a factor. A MANOVA with contrasts was run, where the variables at T1 (five categories after each of three questions) and those at T2 were the dependent variables (Pillai's Trace = .56;  $F(96, 1182) = 1.26$ ;  $p < .05$ ). The univariate analysis showed that stable bullies gave more irrelevant answers in the spontaneous situation (T1) in comparison to unstable bullies ( $F(6) = 2.51$ ;  $p < .05$ ) and that stable bully/victims blamed the perpetrator (T2) more than their unstable counterparts ( $F(6) = 2.34$ ;  $p < .05$ ).

## DISCUSSION

The results of this study support the recommendation of Crick and Dodge [1999] to approach the subject of bullying from the perspective of social information processing. Bullies as well as victims reported less assertive strategies in reaction to provocation—suggesting lower social competence—than not involved children. Surprisingly, we did not find a significant difference in terms of assertiveness between those not involved and the bully/victims. In fact, bully/victims are usually described as extremely impulsive and hyperactive, with difficulties in modulating their behavior [Schwartz et al., 2001]. However, our procedure failed to reveal this characteristic. The reason for that may be (partly) found in the use of judgements based on scenarios, which might have elicited little emotional involvement. Other types of measures [self-reports for instance; O'Moore and Kirkham, 2001] as well as the use of different criteria for dividing children into each role could have yielded different results.

Apart from assertiveness, no other response selection differences were found, indicating that the other four strategies studied (aggression, help, avoidance, and irrelevance) were chosen in equal measure by those involved and those not involved in bullying. Furthermore, the assertiveness differences between bullies and victims and those not involved were less clear after reflection, suggesting that the necessary social knowledge may be present in bullies or victims, but may not always be applied.

As suggested by Rudolph and Heller [1997], children supplied different answers when given the opportunity to reflect. Although three categories (help, assertiveness, and avoidance) did not differ between the spontaneous situation, the first prompt, and the best solution, the categories aggression and irrelevance did differ. Aggression decreased and was mentioned less often as best strategy. This confirms that more nonaggressive solutions are provided if children ponder alternatives and do not act on the basis of their first idea. Unfortunately, many answers given after reflection were irrelevant, indicating that children did not answer properly or did not answer at all. This may be partly due to the relatively young age of the participants. But it also suggests that, at least at this age, children find it difficult to consider alternative options; that is, to act as social strategists. However, a positive interpretation of this finding would be that there is still room for teaching alternative solutions, especially assertive responses, in order to avoid the development of chronic aggressive behavior [Keltikangas-Järvinen and Pakaslahti, 1999].

The fact that the children in most cases (spontaneous reactions as well as after reflection) expressed that they would seek help also suggests that at this age they have difficulties in dealing with provocation situations [Rogers and Tisak, 1996]. Given the power imbalance between bullies and victims which characterizes the bullying situation, other people (adults and peers) can be useful to re-establish the balance. The practical application is that it may be advisable to improve this source of help. In fact, it has been found that bullying usually takes place when adults are absent [Olweus, 1993] and that children often report feeling uncomfortable talking to adults about bullying and failing to obtain much support from teachers and peers [Whitney and Smith, 1993]. Peers as natural helpers might be useful against bullying [Salmivalli, 1999] and intervention programs may be developed using, for example, mediation, conflict resolution or group discussions.

When children were asked to attribute intent in ambiguous situations, the results partly supported our hypotheses. Contrary to expectations, the most direct hostility indication (meanness) showed no difference between groups. However, bully/victims attributed more blame to the perpetrators, were angrier with them and would have retaliated more than those not involved, suggesting that they did not consider the possibility that the perpetrator meant no harm. Thus, they show deficits in the second step of social information processing (interpretation of social cues) and in the fifth step (response decision), as has often been suggested with respect to both reactively and proactively aggressive children [Crick and Dodge, 1996; Dodge and Coie, 1987]. These responses may occur as a chain of events: thinking the perpetrator is blameworthy heightens the emotion of anger (or the other way around: anger leads to blame), which, in its turn, may lead to retaliation through aggressive behavior [Crick and Dodge, 1994; Loeber and Coie, 2001]. Another interesting outcome is that bully/victims more often think the perpetrator is to blame than bullies. This supports the notion that bullies do not necessarily make wrong attributions in ambiguous situations [Crick and Dodge, 1996; Pettit et al., 2001].

Victims did not show a clear tendency to attribute hostile intent, contrary to our expectation. Waldman [1996] claimed that isolated children (a group which may overlap with victims of bullying) do not differ from control children in terms of attributions of intent. If victimized children are also depressed, we might also explain the lack of hostile attributions in victims as a sign of their internal locus of control, i.e., depressed children attribute others' negative intentions and actions to their own fault [Quiggle et al., 1992].

The results on stability yielded some interesting outcomes. In fact, stably involved bullies provided more irrelevant answers than their unstable counterparts even in the spontaneous

situation, when the frequency of such answers was generally quite low. This finding is in line with the studies claiming that socially maladjusted children show a deficit in generating any kind of solution [Pakaslahti, 2000; Spivack and Shure, 1982]. This can be due to the fact that aggressive children have difficulties in memory-search processes [Huesmann, 1988]. We may surmise that stable bullies run the risk of developing insufficient socially competent strategies. In ambiguous situations, children stably involved as bully/victim blamed others more than those who were unstably involved. This result supports our finding that bully/victims' deficits in step 2 of social information processing become more and more severe once the role becomes firmly established.

Although the stability results suggest that chronic involvement is a stronger risk factor for development than incidental involvement [Loeber and Le Blanc, 1990], we think that the stability outcomes merit further investigation. In fact, our stably involved group consisted of only a small number of subjects and we only investigated data at two points in time. Another limitation of this study was that the use of provocation situations at T1 and of ambiguous situations at T2 did not allow us to investigate whether these two aspects of the social information processing of bullies, victims and bully/victims change with the passing of time. A suggestion for future research would be to focus on a longitudinal study of children involved in bullying. Moreover, more research is needed to find out whether there is a causal link between involvement in bullying and social information processing. In fact, we do not know what comes first: whether assertiveness prevents involvement in bullying or the other way around, or whether there is another cause. Finally, further research is needed to investigate the role of gender in social information processing and bullying. In fact, there is evidence that boys and girls differ in the way in which they process information, reason or take decisions [Crick and Dodge, 1994; Pakaslahti, 2000]. In our study we did not find gender differences. This may be because we assigned the roles in the bullying situation only on the basis of open aggression, while girls are known to use this form of aggression less often and to prefer more relational ways of harassing others [Björkqvist et al., 1992; Crick and Bigbee, 1998]. An interesting suggestion for further research would be to investigate the distinction between assertiveness and proactive aggression, as in our study we excluded proactive aggression from the assertiveness construct.

In sum, we think that our results echo the findings with respect to reactively and proactively aggressive children [Crick and Dodge, 1996; Loeber and Coie, 2001; Pettit et al., 2001; Rudolph and Heller, 1997]. Our study has the novelty of combining bullying and social information processing. The importance of detecting the ways in which children involved in bullying read social situations is that it can provide a basis for intervention programs which enable children to reflect before acting, to make use of socially competent responses, and, basically, to process social information in a more competent way [Pakaslahti, 2000]. Interventions can also teach children that aggression is neither legitimate nor useful for obtaining power or reaching goals, and that it is always possible to find less hostile, more assertive solutions than aggression.

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